



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,167	07/18/2003	Emigdio Jesus Salmon	4159.3005	2709
7590 Constance Gall Rhebergen BRACEWELL & PATTERSON, L.L.P. P.O. Box 61389 Houston, TX 77208-1389			EXAMINER DOUGLAS, JOHN CHRISTOPHER	
			ART UNIT 1764	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/623,167	SALMON, EMIGDIO JESUS
Examiner	Art Unit	
John C. Douglas	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 26 January 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-24 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 26 January 2007 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date: _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

The objections to the drawings and specification and the 112 rejection are overcome by the entry of the new drawings and amended specification. The 103 rejection is maintained:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1, 3-6, 9, 11, 12, 17, 18, 19, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malloy (US 2940921).
2. With respect to claim 1, Malloy discloses reacting a hydrocarbon in a first reactor, cooling and separating the reactor effluent into a C6- fraction and a C7+ fraction, cooling and separating the C6- fraction into a C5-C6 fraction and a C4- fraction, heating

Art Unit: 1764

the C4-fraction and sending it to a second reactor, combining the C7+ fractions from both separation zones where the C7+ fractions is cooled and ultimately arrive at a reformate pool (see Malloy, column 2, lines 9-12, column 2, line 45 – column 3, line 17 and Figure).

3. With respect to claim 3, Malloy discloses everything in claim 1, but does not disclose where the first reactor effluent stream is cooled by heat exchange contact with the second vapor stream. However, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to include where the first reactor effluent stream is cooled by heat exchange contact with the second vapor stream instead of a cooler in order to reduce heating and cooling costs by cooling the reactor effluent with the second vapor and heating the second vapor with the reactor effluent.

4. With respect to claims 4 and 5, Malloy discloses where the hydrocarbon feed boils between 80 and 400 degrees F (pentane to decane boils approximately between 80 and 400 degrees F) (see Malloy, column 2, lines 9-10).

5. With respect to claim 6, Malloy discloses where the hydrocarbon feed is heated to between about 950 to about 1050 degrees F and is under a pressure of about 50 to about 750 psig (see Malloy, column 2, lines 9-26).

6. With respect to claims 9 and 17, Malloy discloses where the feed to the second reactor is heated to 900 degrees F (see Malloy, column 1, lines 66-72).

7. With respect to claims 11, 18, and 23, Malloy does not disclose controlling the step of cooling the first reactor stream based upon a first discharge temperature of the

first cooler and a second discharge temperature of the second cooler. However, the court in *In re Venner*, 262 F.2d 91, 95 (CCPA 1958), held that broadly providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art. Claims 11, 18, and 23 simply disclose a method of controlling the reactor effluent by reading the discharge temperatures of the first and second reactor, which would be automating a process that could be performed manually by reading the temperatures and adjusting the process accordingly. Therefore, it would have been obvious to modify the process of Malloy to include controlling the first reactor effluent stream.

8. With respect to claim 12, Malloy discloses reacting the second vapor stream in the second reactor to produce a second reactor effluent stream. Malloy does not disclose cooling and separating the second reactor effluent into a C6- fraction and a C7+ fraction; cooling and separating the C6- fraction into a C5-C6 fraction and a C4- fraction, heating the C4-fraction and sending it to a third reactor, combining the C7+ fractions from both separation zones where the C7+ fractions is cooled and ultimately arrive at a reformate pool.

However, Malloy discloses cooling and separating the first reactor effluent into a C6- fraction and a C7+ fraction, cooling and separating the C6- fraction into a C5-C6 fraction and a C4- fraction, heating the C4-fraction and sending it to a second reactor, combining the C7+ fractions from both separation zones where the C7+ fractions is cooled and ultimately arrive at a reformate pool (see Malloy, column 2, lines 9-12, column 2, line 45 – column 3, line 17 and Figure).

According to *In re Harza*, 274 F.2d 669 (CCPA 1960), the mere duplication of parts has no patentable significance unless a new or unexpected result is produced (see MPEP §2144.04 VI. C.). In this case the duplication of parts is the duplication of the separation sequence following the first reactor to be performed following the second reactor. Therefore, it would be obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to include cooling and separating the second reactor effluent into a C6- fraction and a C7+ fraction, cooling and separating the C6- fraction into a C5-C6 fraction and a C4- fraction, heating the C4-fraction and sending it to a third reactor, combining the C7+ fractions from both separation zones where the C7+ fractions is cooled and ultimately arrive at a reformate pool because such a modification is in effect a duplication of parts and is therefore *prima facie* obvious.

9. With respect to claim 19, Malloy discloses reacting a hydrocarbon in a first reactor, cooling and separating the reactor effluent into a C6- fraction and a C7+ fraction, cooling and separating the C6- fraction into a C5-C6 fraction and a C4- fraction, heating the C4-fraction and sending it to a second reactor, combining the C7+ fractions from both separation zones where the C7+ fractions is cooled and ultimately arrive at a reformate pool (see Malloy, column 2, lines 9-12, column 2, line 45 – column 3, line 17 and Figure).

Malloy does not disclose sending a second portion of the second vapor stream to a third reactor and combining the effluent of the first and second reactors before the effluent stream is cooled.

However, according to *In re Burhans* 154 F.2d 690 (CCPA 1946), the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results.

In the instant case the difference between claim 19 and the prior art is that the second vapor enters the third reactor after it exits the second reactor and part of the effluent of the third reactor combines with part of the effluent of the first reactor (see Malloy, figure). Thus, the difference between Malloy and claim 19 is the sequence adding the second vapor stream to the third reactor and the stage at which the first and second reactor effluent are combined. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to include sending a second portion of the second vapor stream to a third reactor and combining the effluent of the first and second reactors before the effluent stream is cooled because such a modification is a change in the order of performing process steps and thus is *prima facie* obvious in the absence of new or unexpected results.

10. With respect to claim 24, Malloy discloses everything in claim 19, but does not disclose where the first reactor includes a series of reformer reactors. However, According to *In re Harza*, 274 F.2d 669 (CCPA 1960), the mere duplication of parts has no patentable significance unless a new or unexpected result is produced (see MPEP §2144.04 VI. C.). In this case the duplication of parts is the duplication of the first reactor into a chain of reactors in series. Therefore, it would be obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to

include where the first reactor includes a series of reformer reactors because such a modification is a duplication of parts and is therefore *prima facie* obvious.

11. Claims 2, 13, and 20 where interpreted as best as possible and are rejected under 35 U.S.C. 103(a) as being unpatentable over Malloy in view of Rambo (US 5890378). Malloy discloses everything in claim 1, 12, and 19, but does not disclose where the cooling and separating steps are performed in an absorber.

However, Rambo discloses an absorber that cools and separates a liquid feed into a vapor stream and a liquid stream (see Rambo, column 6, lines 46-57 and column 10, line 64 – column 11, line 13).

Rambo discloses that an absorber is used to condense and absorb the heavier components (see Rambo, column 6, lines 51-55).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to include an absorber that cools and separates a liquid feed into a vapor stream and a liquid stream in order to condense the heavy components of the feed.

12. Claims 7, 8, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malloy in view of Swan (US 5203988). Malloy discloses everything in claims 1 and 12, but does not disclose where the coolers are operated to cool the streams to about 250 to about 360 degrees F.

However, Swan discloses cooling the reaction product in the range from about 100 to about 300 degrees F (see Swan, column 6, lines 1-5).

Swan discloses that such a temperature is generally used to achieve aromatics separation (see Swan, column 6, lines 1-8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to include cooling the reaction product in the range from about 100 to about 300 degrees F in order to achieve aromatics separation.

13. Claims 10, 14, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malloy in view of Choi (US 4401554). Malloy discloses everything in claims 1, 12, and 19, but does not disclose supplying a portion of the hydrocarbon feed to the second or third reactor as a second or third hydrocarbon feed stream.

However, Choi discloses where a portion of the feed is fed to a subsequent reactor (see Choi, column 6, lines 8-18).

Choi discloses that feeding a portion to the third reactor results in a lower average partial pressure, thereby improving benzene-toluene-xylene yield (see Choi, column 6, lines 8-18).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Malloy to include where a portion of the feed is fed to a subsequent reactor in order to improve benzene-toluene-xylene yield.

Response to Arguments

Applicant first argues that their invention is distinguishable from Malloy because Malloy separates out the paraffin fraction while Applicant's invention treats the paraffins. However, Malloy does treat the paraffin fraction (see Malloy, Figure).

Applicant's second argument is that the current invention combines the first and second liquid stream and immediately sends the combined stream to the reformatte pool. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., combined and immediately sent to reformatte pool) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

14. Applicant's third argument is that there is no motivation to add the invention of Rambo with the invention of Malloy. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Rambo discloses that an absorber is used to condense and

absorb the heavier components, which are C4+ (see Rambo, column 6, lines 51-55).

The Groups of Malloy are also C4+ (see Malloy, column 1, line 18).

Applicant's fourth argument is that Choi discloses splitting the hydrogen feed to the first and third reactor, while the current invention splits the hydrocarbon feed. However, Choi also discloses splitting the hydrocarbon feed to the first and third reactor (see Choi, column 5, lines 48-62 and Figure 1).

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Douglas whose telephone number is 571-272-1087. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M..

Art Unit: 1764

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Calderola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCD

4/14/2007



Glenn Calderola
Supervisory Patent Examiner
Technology Center 1700